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Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)			<i>Complete if Known</i>		
			Application Number		
			Filing Date		
			First Named Inventor		
			Group Art Unit		
			Examiner Name		
Sheet	1	of	3	Attorney Docket Number	IMMR-095/02US

PTO/SB/08A (08-00)

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code <sup>2</sup> (if known)		
AE		5,785,630		Bobick, et al.	07/28/1998
		5,766,016		Sinclair et al.	06/16/1998
		5,547,382		Yamasaki et al.	08/20/1996
		5,466,213		Hogan et al.	11/14/1995
		5,334,027		Wherlock	08/02/1994
		5,309,140		Everett, Jr., et al.	05/03/1994
		5,299,810		Pierce et al.	04/05/1994
		5,275,174		Cook	01/04/1994
		5,271,290		Fischer	12/21/1993
		5,240,417		Smithson et al.	08/31/1993
		5,212,473		Louis	05/18/1993
		5,078,152		Bond et al.	01/07/1992
		5,038,089		Szakaly	08/06/1991
		5,035,242		Franklin et al.	07/30/1991
		5,022,407		Horch et al.	06/11/1991
		5,019,761		Kraft	05/28/1991
		4,934,694		McIntosh	06/19/1990
		4,930,770		Baker	06/05/1990
		4,891,764		McIntosh	01/02/1990
		4,794,392		Selinko	12/27/1988
		4,713,007		Alban	12/15/1987
		4,708,656		de Vries et al.	11/24/1987
		4,599,070		Hladky et al.	07/08/1986
		4,581,491		Boothroyd	04/08/1986
		4,513,235		Acklam et al.	04/23/1985
		4,236,325		Hall et al.	12/02/1980
		4,160,508		Salisbury, Jr.	07/10/1979
		3,911,416		Feder	10/07/1975
		3,903,614		Diamond et al.	09/09/1975
		3,902,687		Hightower	09/02/1975
		3,623,064		Kagan	11/23/1971
		3,517,446		Corlyon et al.	06/30/1970
		3,497,668		Hirsch	02/24/1970
		3,220,121		Cutler	11/30/1965
		3,157,853		Hirsch	11/17/1964
		6,411,276	B1	Braun et al.	06/2002
		6,448,977	B1	Braun et al.	09/2002
		2002/0054011	A1	Bruneau et al.	05/2002
		2002/0021277	A1	Kramer et al.	02/2002
		6,469,692	B2	Rosenberg	10/22/2002
		6,219,034	B1	Elbing et al.	04/17/2001
		2002/0097223	A1	Rosenberg	07/25/2002
		2001/0010513	A1	Rosenberg et al.	08/02/2001
		2002/0024501	A1	Shalit	02/28/2002
		6,697,043	B1	Shaholian	02/28/2004

<sup>1</sup> Unique citation designation number.

<sup>2</sup> See attached Kinds of U.S. Patent Documents.

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		EP	0 349 086	A1	Stork Kwant B.V.	01/03/1990

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		
AE		Baigrie, "Electric Control Loading – A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990		
		Iwata, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993		
		Russo, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," <i>MIT Libraries Archives</i> pp. 1-131, May 1990, archived 8/14/90		
		Brooks et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," <i>JPL Publication 85-11</i> , NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985		
		Jones et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990		
		Burdea et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," <i>1993 IEEE International Conference on Robotics and Automation</i> , pp. 25-44, 05/02/1993		
		Snow et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4 with 45 pages of attachments, 06/15/1989		
		Ouh-Young, "Force Display in Molecular Docking," Doctoral Dissertation, University of North Carolina at Chapel Hill, UMI Order No. 9034744, p. 1-369, 1990		
		Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," <i>MIT Archive</i> , pp. 1-88, February 1990, archived 8/13/90		
		Caldwell et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993		
		Adelstein et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992		
		Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337		
		Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992		
		Russo, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 63-70, ASME 1992		
		Kontarinis et al., "Display of High-Frequency Tactile Information to Teleoperators," <i>Telemanipulator Technology and Space Telerobotics</i> , Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993		
		Patrick et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics in Space</i> , Rui J. deFigueiredo et al, Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990		
		Adelstein, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90		
		Bejczy, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980		
		Bejczy et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981		
		McAffee et al., "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL 1988, JPL D-5172		
✓		Minsky, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95		

<sup>1</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

<sup>2</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>3</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

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AE		Jacobsen et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference &amp; Exposition</i> , Hollywood, Florida, May 21-23, 1991	
		Shimoga, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30- Oct. 1, 1992	
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990	
		Terry et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988	
		Howe, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992	
		Eberhardt et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993	
		Rabinowitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contractor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987	
		Bejczy et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980	
		Bejczy et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop, JSC</i> , Houston, TX, July 25-27, 1989	
		Ouhyoung et al., "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995	
		Marcus, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sep. 8-11, 1994	
V		Bejczy, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987	

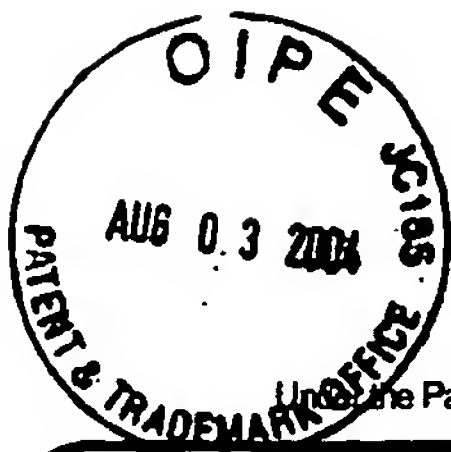
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(1 of 2)

PTO/SB/08A (10-01)

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 7

### Complete if Known

Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR095/02US

U.S. PATENT DOCUMENTS					
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AE		20030201975	10/30/03	Bailey et al.	
		20020030663	3/14/02	Tierling et al.	
		20020024501	03/04/1999	Shallt	
		6,717,573	4/6/04	Shahoian et al.	
		6,707,443	3/16/04	Bruneau et al.	
		6,585,595	7/1/03	Soma et al.	
		6,424,333	7/23/02	Tremblay et al.	
		6,422,941	7/23/2002	Thomer et al.	
		6,317,032	11/13/01	Oishi	
		6,275,213	8/14/01	Tremblay et al.	
		6,211,861	4/3/01	Rosenberg et al.	
		6,198,206	3/6/01	Saarmaa et al.	
		6,184,868	2/6/01	Shahoian et al.	
		6,160,489	12/12/2000	Perry et al.	
		6,111,577	8/29/2000	Zilles et al.	
		6,104,158	8/5/00	Jacobus et al.	
		6,088,019	7/11/00	Rosenberg	
		6,088,017	7/11/00	Tremblay et al.	
		6,078,126	6/20/00	Rollins et al.	
		6,044,646	4/4/00	Silverbrook	
		6,004,134	12/21/99	Marcus et al.	
		6,001,014	12/14/99	Ogata et al.	
		5,986,643	11/16/99	Harvill et al.	
		5,984,880	11/16/99	Lander et al.	
		5,973,670	10/26/99	Barber et al.	
		5,945,772	8/31/99	Macnak et al.	
		5,914,705	6/22/99	Johnson et al.	
		5,897,437	4/27/99	Nishiumi et al.	
		5,894,263	4/13/99	Shimakawa et al.	
		5,889,672	3/30/99	Schuler et al.	
		5,857,986	1/12/99	Moriyasu	
		5,805,140	9/8/98	Rosenberg et al.	
		5,790,108	8/4/98	Salcudean et al.	
		5,784,052	7/21/98	Keyson	

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AE		5,781,172	7/14/98	Engel et al.	
		5,754,023	5/19/98	Roston et al.	
		5,742,278	4/21/98	Chen et al.	
		5,739,811	4/14/98	Rosenberg et al.	
		5,736,978	4/7/98	Hasser et al.	
		5,734,373	3/31/98	Rosenberg et al.	
		5,714,978	2/3/98	Yamanaka et al.	
		5,709,219	1/20/98	Chen et al.	
		5,690,582	11/25/1997	Ulrich et al.	
		5,684,722	11/4/97	Thomer et al.	
		5,669,818	9/23/97	Thomer et al.	
		5,661,446	8/26/97	Anderson et al.	
		5,643,087	7/1/97	Marcus et al.	
		5,631,861	5/20/97	Kramer	
		5,619,180	4/8/97	Massimino et al.	
		5,589,828	12/31/96	Armstrong	
		5,587,937	12/24/96	Massie et al.	
		5,583,478	12/10/96	Renzi	
		5,580,251	12/3/96	Gilkes et al.	
		5,575,761	11/19/1996	Hajianpour	
		5,565,840	10/15/96	Thomer et al.	
		5,440,183	8/8/95	Denne	
		5,437,607	8/1/1995	Taylor	
		5,436,622	7/25/1995	Gutman et al.	
		5,405,152	4/11/95	Katanics et al.	
		5,399,091	3/21/95	Mitsumoto	
		5,388,992	2/14/95	Franklin et al.	
		5,354,162	10/11/94	Burdea et al.	
		5,296,871	3/22/94	Paley	
		5,283,970	2/8/1994	Aigner	
		5,203,563	4/20/93	Loper, III	
		5,186,695	2/16/1993	Mangseth et al.	
		5,186,629	2/16/93	Rohen	
		5,184,319	2/2/93	Kramer	

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AE		5,175,459	12/29/1992	Danial et al.	
		5,165,897	11/24/1992	Johnson	
		5,146,566	9/8/92	Hollis, Jr. et al.	
		5,107,262	4/21/92	Cadoz et al.	
		5,103,404	4/7/92	McIntosh	
		5,022,384	6/11/1991	Freels	
		4,885,565	12/5/89	Embach	
		4,868,549	9/19/89	Affinito et al.	
		4,795,296	1/3/89	Jau	
		4,731,603	3/15/88	McRae et al.	
		4,706,294	11/10/87	Ouchida	
		4,484,191	11/20/1984	Vavra	
		4,464,117	8/7/1984	Foerst.	
		4,414,984	11/15/83	Zarudiansky	
		4,333,070	6/1/1982	Barnes	
		4,262,549	4/21/1981	Schwellenbach	
		4,127,752	11/28/1978	Lowthorp	
		2,972,140	2/14/1961	Hirsch	
		RE37,374	9/18/01	Roston et al.	

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		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		JP	H2-185278		7/19/1990	Taito Corporation	
		JP	H4-8381		1/13/1992	Epoch Co. and Key- Planning Co.	
		JP	H7-24147		1/27/1995	Sega Corporation	
		JP	H5-192449		8/3/1993	Taito Corporation	
		WO	92/00559		9 Jan 92		
		EP	0607580		27.07.94		
		EP	0265011		27.04.88		
		EP	0626634		11.5.94		
		WO	01/03105		11.1.01		
		WO	01/24158		5.4.01		
		WO	97/31333		28.8.97		

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		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
AE		WO	01/13354		22 Feb 01		
		WO	98/32112		7.23.98		
		WO	99/40504		12.8.99		
		WO	02/27705		4.4.02		

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Substitute for form 1449A/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		Application Number	10/816,954
		Filing Date	April 5, 2004
		First Named Inventor	Erik J. Shahoian
		Art Unit	2673
		Examiner Name	Unassigned
Sheet 5 of 7	Attorney Docket Number	IMMR095/02US	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
AE		PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," <i>Master of Science Thesis</i> , MIT, Aug. 1990, archived Nov. 8, 1990.	
		CALDER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," <i>Bachelor of Science Thesis</i> , MIT, May 1983, archived June 23, 1983.	
		WIKER, "Teletouch Display Development: Phase 1 Report," <i>Technical Report 1230</i> , Naval Ocean Systems Center, San Diego, July 1988.	
		BLISS, "Optical-to-Tactile Image Conversion for the Blind," <i>IEEE Transactions on Man-Machine Systems</i> , Vol. MMS-11, No. 1, March 1970.	
		JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," <i>Armstrong Aerospace Medical Research Laboratory</i> , AAMRL-TR-90-039, August, 1990.	
		KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," <i>PRESENCE</i> , 4(4):387-402, Harvard Univ., 1995.	
		AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.	
		EBERHARDT et al., "Inducing Dynamic Haptic Perception by The Hand: System Description and Some Results," <i>DSC-Vol. 55-1, Dynamic Systems and Control: Volume 1</i> , ASME 1994.	
		GOBEL et al., "Tactile Feedback Applied to Computer Mice," <i>International Journal of Human-Computer Interaction</i> , Vol. 7, No. 1, pp. 1-24, 1995.	
		PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 <sup>nd</sup> Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.	
		"Cyberman Technical Specification," <i>Logitech Cyberman SWIFT Supplement to Logitech Mouse Technical Reference and Programming Guide</i> , 4/5/1994.	
		OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," <i>Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95</i> , Seoul, Korea, 21-24 August 1995.	
		KACZMAREK et al., "Tactile Displays," <i>Virtual Environment Technologies</i> , Chap. 9, pp. 349-414.	
		LAKE, "Cyberman from Logitech," at <a href="http://www.ibiblio.org/GameBytes/Issue21/greviews/cyberman.html">http://www.ibiblio.org/GameBytes/Issue21/greviews/cyberman.html</a> , 1994.	
		"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 28 January 2002 (3 pages).	
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		First Named Inventor	Erik J. Shahoian
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AE		"Technical Manual Overhaul Instructions With Parts Breakdown, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 15 July 1980 (23 pages).	
		SCANNELL, "Taking a Joystick Ride," <i>Computer Currents</i> , Boston Edition, Vol. 9, No. 11, November 1994	
		YAMAKITA et al., "Tele-Virtual Reality of Dynamic Mechanical Model," <i>Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems</i> , Raleigh, NC, July 7-10, 1992	
		NOLL, "Man-Machine Tactile," <i>SID Journal</i> , July/August 1972 Issue.	
		ROSENBERG, "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance In Telepresence Tasks," <i>Ph.D. Dissertation</i> , Stanford University, June 1994.	
		Schmult, Brian et al., "Application Areas for a Force-Feedback Joystick," ASME 1993, DSC-Vol. 49, pp. 47-54.	
		Hasser, Christopher John, "Tactile Feedback for a Force-Reflecting Haptic Display," The School of Engineering, University of Dayton, December 1995, pp. iii-xii & 1-96.	
		Akamatsu, M. et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," <i>Presence</i> , Vol. 3, No. 1, 1994, pp. 73-80.	
		Kelley, A. J. et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Dept. of Elec. Eng., Univ. of Brit. Columbia, 1993, pp. 1-27.	
		Hasser, C. et al., "Tactile Feedback with Adaptive Controller for a Force-Reflecting Haptic Display," Parts 1&2, IEEE 0-7803-3131-1, 1996, pp. 526-533.	
		Ramstein, C., "Combining Haptic and Braille Technologies: Design Issues and Pilot Study," ASSETS '96, 2nd Annual ACM Conf. on Assistive Technologies, 1996, pp. 37-44.	
		Dennerlein, et al., "Vibrotactile Feedback for Industrial Telemanipulators," ASME IMECE, 6th Annual Symp. On Haptic Interfaces for Virtual Environment and Teleoperator Systems, Nov. 1997, pp. 1-7.	
		Minsky, Margaret et al., "Feeling and Seeing: Issues in Force Display," ACM 089791-351-5, 1990, pp. 235-242.	
		Ouh-young, M. et al., "Creating an Illusion of Feel: Control Issues in Force Display," Computer Science Dept., University of North Carolina, 1989, pp. 1-14.	
		Hasser, C., "Force-Reflecting Anthropomorphic Hand Masters," AL/CF-TR-1995-0110, 1995, pp. 5-31.	

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		First Named Inventor	Erik J. Shahoian
		Art Unit	2673
		Examiner Name	Unassigned
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AE		Kim, Won, "Telemanipulator Technology and Space Telerobotics," SPIE Proceedings, 1993, Vol. 2057, pp. 40-50.	

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Sheet 1 of 8

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Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR095/02US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (# known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
AE		6,128,006	10-2000	Rosenberg	
		6,100,874	08-2000	Schena et al.	
		6,088,019	06-2000	Rosenberg	
		6,088,017	06-2000	Tremblay et al.	
		6,078,308	06-2000	Rosenberg et al.	
		6,061,004	05-2000	Rosenberg	
		6,028,593	02-2000	Rosenberg et al.	
		6,020,876	02-2000	Rosenberg et al.	
		6,005,551	12-1999	Osborne et al.	
		6,004,134	12-1999	Marcus et al.	
		6,001,014	12-1999	Ogata	
		5,990,869	11-1999	Kubica et al.	
		5,986,643	11-1999	Harvill et al.	
		5,973,689	10-1999	Gallery	
		5,959,613	09-1999	Rosenberg et al.	
		5,956,484	09-1999	Rosenberg et al.	
		5,956,016	09-1999	Kruenzner et al.	
		5,944,151	08-1999	Jakobs et al.	
		5,914,705	06-1999	Johnson et al.	
		5,912,661	06-1999	Siddiqui	
		5,897,437	04-1999	Nishlumi et al.	
		5,889,672	03-1999	Schuler et al.	
		5,889,670	03-1999	Schuler et al.	
		5,880,714	03-1999	Rosenberg et al.	
		5,877,748	03-1999	Redlich	
		5,857,986	01-1999	Moriyasu	
		5,844,392	12-1998	Peurach et al.	
		5,831,408	11-1998	Jacobus et al.	
		5,825,308	10-1998	Rosenberg	
		5,823,876	10-1998	Unbehand	
		5,821,921	10-1998	Osborn et al.	
		5,808,603	09-1998	Chen	
		5,808,601	09-1998	Leah et al.	
		5,805,165	09-1998	Thome, III et al.	

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**INFORMATION DISCLOSURE  
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Sheet **2** of **8**

Complete if Known

Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR095/02US

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AE		5,805,140	09-1998	Rosenberg et al.	
		5,802,353	09-1998	Avila et al.	
		5,790,108	08-1998	Salcudean et al.	
		5,784,052	07-1998	Keyson	
		5,781,172	07-1998	Engel et al.	
		5,771,037	06-1998	Jackson	
		5,767,839	06-1998	Rosenberg	
		5,760,764	06-1998	Martineilli	
		5,757,358	05-1998	Osga	
		5,755,577	05-1998	Gillio	
		5,754,023	05-1998	Rosten et al.	
		5,745,715	04-1998	Pickover et al.	
		5,742,278	04-1998	Chen et al.	
		5,739,811	04-1998	Rosenberg et al.	
		5,736,978	04-1998	Hasser et al.	
		5,734,373	03-1998	Rosenberg et al.	
		5,724,278	03-1998	Chen et al.	
		5,721,566	02-1998	Rosenberg et al.	
		5,714,978	02-1998	Yamanaka	
		5,709,219	01-1998	Chen et al.	
		5,696,537	12-1997	Solhjell	
		5,694,013	12-1997	Stewart et al.	
		5,691,898	11-1997	Rosenberg et al.	
		5,691,747	11-1997	Amano	
		5,684,722	11-1997	Thomer et al.	
		5,666,473	09-1997	Wallace	
		5,666,138	09-1997	Culver	
		5,658,901	08-1997	Kurita	
		5,643,087	07-1997	Marcus et al.	
		5,642,469	06-1997	Hannaford et al.	
		5,629,594	05-1997	Jacobus et al.	
		5,625,576	04-1997	Massie et al.	
		5,598,347	01-1997	Robertson et al.	
		5,589,854	12-1996	Tsal	

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet **3** of **8****Complete if Known**

Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
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AE		5,589,828	12-1996	Armstrong	
		5,583,478	12-1996	Renzi	
		5,583,407	12-1996	Yamaguchi	
		5,576,727	11-1996	Rosenberg et al.	
		5,565,887	10-1996	McCambridge et al.	
		5,565,840	10-1996	Thomer et al.	
		5,550,562	08-1996	Aoki et al.	
		5,542,672	08-1996	Meredith	
		5,530,455	06-1996	Gillick et al.	
		5,513,100	04-1996	Parker et al.	
		5,512,919	04-1996	Araki	
		5,506,605	04-1996	Paley	
		5,491,477	02-1996	Clark et al.	
		5,473,344	12-1995	Bacon et al.	
		5,473,235	12-1995	Lance et al.	
		5,471,571	11-1995	Smith et al.	
		5,459,382	10-1995	Jacobus et al.	
		5,457,479	10-1995	Cheng	
		5,451,924	09-1995	Massimino et al.	
		5,414,337	05-1995	Schuler	
		5,405,152	04-1995	Katanics et al.	
		5,399,091	03-1995	Misumoto	
		5,398,044	03-1995	Hill	
		5,396,266	03-1995	Brimhall	
		5,388,992	02-1995	Franklin et al.	
		5,381,080	01-1995	Schnell et al.	
		5,355,148	10-1994	Anderson	
		5,354,162	10-1994	Burdea et al.	
		5,313,230	05-1994	Venolia et al.	
		5,296,871	03-1994	Paley	
		5,286,203	02-1994	Fuller et al.	
		5,275,565	01-1994	Moncrief	
		5,264,788	11-1993	Gregory et al.	
		5,235,868	08-1993	Culver	

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/Alexander Eisen/

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05/30/2006

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**INFORMATION DISCLOSURE  
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Sheet **4** of **8****C m p l t e i f K n w n**

Application Number	<b>10/816,954</b>
Filing Date	<b>April 5, 2004</b>
First Named Inventor	<b>Erik J. Shahoian</b>
Art Unit	<b>2673</b>
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<b>AE</b>		5,223,776	06-1993	Radke et al.	
		5,220,280	06-1993	Schuler	
		5,203,563	04-1993	Loper, III	
		5,197,003	03-1993	Moncrief et al.	
		5,193,963	03-1993	McAfee et al.	
		5,189,355	02-1993	Larkins et al.	
		5,186,629	02-1993	Rohen	
		5,185,561	02-1993	Good et al.	
		5,184,319	02-1993	Kramer	
		5,146,566	09-1992	Hollis, Jr. et al.	
		5,139,261	08-1992	Openlano	
		5,116,180	05-1992	Fung et al.	
		5,107,262	04-1992	Cadoz et al.	
		5,107,080	04-1992	Rosen	
		5,103,404	04-1992	McIntosh	
		5,095,303	03-1992	Clark et al.	
		5,076,517	12-1991	Ferranti et al.	
		5,065,145	11-1991	Purcell	
		5,044,956	09-1991	Behensky et al.	
		5,004,391	04-1991	Burdea	
		4,983,901	01-1991	Lehmer	
		4,961,038	10-1990	MacMinn	
		4,949,119	08-1990	Moncrief et al.	
		4,935,728	06-1990	Kley	
		4,906,843	03-1990	Jones et al.	
		4,896,554	01-1990	Culver	
		4,868,549	09-1989	Affinito et al.	
		4,861,269	08-1989	Meenen, Jr.	
		4,839,838	06-1989	LaBiche et al.	
		4,800,721	01-1989	Cemenska et al.	
		4,795,296	01-1989	Jau	
		4,794,384	12-1988	Jackson	
		4,787,051	11-1988	Olson	
		4,782,327	11-1988	Kley et al.	

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05/30/2006

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Substitute for form 1449A/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		Application Number	10/816,954
		Filing Date	April 5, 2004
		First Named Inventor	Erik J. Shahoian
		Art Unit	2673
		Examiner Name	Unassigned
Sheet 5 of 8	Attorney Docket Number	IMMR095/02US	

U.S. PATENT DOCUMENTS					
Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
AE		4,604,016	08-1986	Joyce	
↓		4,477,043	10-1984	Repperger	
		4,436,188	03-1984	Jones	
		3,919,691	11-1975	Noll	
		3,875,488	04-1975	Crocker et al.	

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
AE		EP	0 626 634	A2	11-1994		
↓		WO	96 28777		09-1996		
		WO	97 12357		04-1997		
		WO	97 21160		06-1997		
		WO	97 31333		08-1997		
		WO	98 08159		02-1998		
		WO	98 24183		08-1998		
		WO	98 58323		12-1998		
		WO	2343499	A	12-1999		
		WO	00 03319		01-2000		
		WO	00 21071		04-2000		
		EP	0085518	A1	01-1983		
		EP	0265011		04-1988		
		EP	0607580	A1	07-1994		
		EP	062664	A2	11-1994		
		EP	875819		04-1998		
		WO	92 00559		01-1992		
↓		WO	95 20788		08-1995		
		WO	95 32459		11-1995		

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		First Named Inventor	Erik J. Shahoian
		Art Unit	2673
		Examiner Name	Unassigned
Sheet 6 of 8	Attorney Docket Number	IMMR095/02US	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
AE		Adachi et al., "Sensory Evaluation of Virtual Haptic Push-Buttons," 1994, Suzuki Motor Corp., pp. 1-7. Akamatsu et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," 1994, Presence vol. 3, pp. 73-80.	
		Adelstein et al., "Design & Implementation of a Force Reflecting Manipulandum for Manual Control Research," 1992, NASA-Ames Research Center and MIT, pp. 1-26.	
		Akamatsu, M. et al., "Multimodal Mouse: A Mouse-Type Device With Tactile and Force Display," Presence, vol. 3, No. 4, Winter 1994, pp. 73-80.	
		Atkinson et al., "Computing with Feeling," Comput. & Graphics, vol. 2, 1977, pp. 97-103.	
		Batter et al., "Grove-1: A computer Display to the sense of Feel," Proc IFIP Congress, 1971, pp. 759-763.	
		Brooks, Jr. et al., "Project GROPE, Haptic Displays for Scientific Visualization," Computer Graphics, vol. 24, #4, 1990, pp. 177-184.	
		Buttolo et al., "Pen-based force Display for Precision Manipulation in Virtual Environments," IEEE 0-8186-7084-3, 1995, pp. 217-224.	
		Christophe Ramstein, "Combining Haptic & Braille Technologies: Design Issues and Pilot Study," 1996, Siggraph pp. 37-44.	
		Colgate et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," Northwestern University, IL, 1993., pp. 1-8.	
		Dennerlein et al., "Vibrotactile Feedback for Industrial Telemanipulators," 1997, Sixth Annual Symp. On Haptic Interfaces for Virtual Env. and Teleoperator Systems, ASME IMECE, Dallas, pp. 1-7.	
		Ellis et al., Design & Evaluation of a High-Performance Prototype Planar Haptic Interface, Dec. 1993, Advances in Robotics, 55-64.	
		Gotow et al., "Perception of Mechanical Properties at the Man-Machine Interface," IEEE CH2503-1, 1987, pp. 688-690.	
		Hannaford et al., "Force-Feedback Cursor Control," NASA Tech Briefs, vol. 13, No. 11, 1989, pp. 1-7.	
↓		Hannaford et al., "Performance Evaluation of a 6-Axis Generalized Force-Reflecting Teleoperator," IEEE Transactions on Systems, Man, and Cybernetics, vol. 21, No. 3, 1991, pp. 621-623, 631-633.	

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**INFORMATION DISCLOSURE  
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Sheet **7** of **8****Compl to If Kn wn**

Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR095/02US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
AE		Hasser, C. et al., "Tactile Feedback With Adaptive Controller for a Force-Reflecting Haptic Display--Part 1: Design," IEEE 0-7803-3131, Jan. 1996.
		Hasser, C., "Tactile Feedback For a Force-Reflecting Haptic Display," School of Engineering, Univ. of Dayton, Dec. 1995.
		Hirota et al., "Development of Surface Display," IEEE 0-7803-1363-1, 1993, pp. 256-262. Rosenberg, "Perceptual Design of a Virtual Rigid Surface Contact," Armstrong Laboratory AL/CF-TR-1995-0029, 1993, pp. 1-45.
		Howe et al., "Task Performance w/ a dextrous Teleoperated Hand System," Proc. of SPIE, vol. 1833, 1992, pp. 1-9.
		Iwata et al., "Artificial Reality w/ Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, vol. 24, No. 4, 1990, pp. 165-170.
		Iwata, Hiroo, "Pen-based Haptic Virtual Environment," IEEE 0-7803-1363-1, 1993, pp. 287-292. Ouh-Young, Ming, "Force Display in Molecular Docking," Dissertation for University of N. Carolina, 1990, pp. 1-42.
		Kelley et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Oct. 19, 1993 University of British Columbia pp. 1-27.
		Kelley et al., "On the Development of a Force-Feedback Mouse and its Integration into a graphical user Interface," Nov. 1994, Engineering Congress and Exhibition, pp. 1-8.
		Kilpatrick et al., "The Use of Kinesthetic Supplement in an Interactive Graphics System," University of North Carolina, 1976, pp. 1-172.
		Millman et al., "Design of a 4 Degree of Freedom Force-Reflecting Manipulandum with a Specified Force/Torque Workspace," IEEE CH2969-4, 1991, pp. 1488-1493.
		Minsky et al., "Feeling & Seeing: Issues in Force Display," ACM089791-351-5, 1990, pp. 235-242, 270.
		Munch et al., "Intelligent Control for Haptic Displays," Eurographics '96, vol. 15, No. 3, 1996, pp. 217-226.
		Ouh-Young et al., "Creating an Illusion of Feel: Control Issues in Force Display," Univ. of N. Carolina, 1989, pp. 1-14.
✓		Payette et al., "Evaluation of a Force Feedback (Haptic) Computer Printing Device in Zero Gravity," Oct. 17, 1996, ASME Dynamics Systems, vol. 58 pp. 547-553.

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STATEMENT BY APPLICANT**

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Sheet 8 of 8

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Application Number	10/816,954
Filing Date	April 5, 2004
First Named Inventor	Erik J. Shahoian
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR095/02US

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AE		Ramstein et al., "The Pantograph: A Large Workspace Haptic Device for a Multimodal Human-Computer Interaction," Computer-Human Interaction, CHI 1994, pp. 1-3.	
		Rosenberg et al., "A Force Feedback Programming Primer," Immersion Corp., 1997, pp. 1-176.	
		Rosenberg et al., "Commercially Viable force feedback Controller for Individuals with Neuromotor Disabilities," Armstrong Laboratory, AL/CF-TR-1997-0016, 1996, pp. 1-33.	
		Rosenberg et al., "Perceptual Decomposition of Virtual Haptic Surfaces," Proc. IEEE Symposium on Research Frontiers in Virtual Reality, 1993, pp. 1-8.	
		Rosenberg et al., "The use of force feedback to enhance graphical user interfaces," Stereoscopic Displays & Virtual Reality Systems, 1996, pp. 243-248	
		Rosenberg, L., "Virtual fixtures as tools to enhance operator performance in telepresence environments," SPIE Manipulator Technology, 1993, pp. 1-12.	
		Russo, "The Design & Implementation of a 3-Degree-of-Freedom Force Output Joystick," Dept. of Mech. Engineering, 1990, pp. 1-42.	
		Schmult et al., "Application Areas for a Force-Feedback Joystick," 1993, Advances in Robotics, vol. 49, pp. 47-54.	
		Su et al., "The Virtual Panel Architecture: A 3D Gesture Framework," University of Maryland, pp. 387-393.	
		Wiker et al., "Development of Tactile Mice for Blind Access to Computers, Importance of Stimulation Locus, Object Size, and Vibrotactile Display Resolution," 1991, Human Factors Society Mtg., pp. 708-712.	
		Winey III, "Computer Stimulated Visual & Tactile Feedback as an Aid to Manipulator & Vehicle Control," MIT, 1981, pp. 1-79.	
↓		Yokokoji et al., "What you can see is what you can feel," IEEE 0-8186-7295-1, 1996, pp. 46-54.	

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05/30/2006

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Information Disclosure Statement by Applicant							Applicant: Erik J. Shahoian et al.			
(Use several sheets if necessary)							Filed: April 5, 2004		Group: 2673	
U.S. Patent Documents										
Init.		Document No.	Date	Name	Class	Subclass	Filing Date			
AE	A	RE34,095	10/13/1992	Padula et al.						
Foreign Documents										
Init.		Document No.	Date	Country	Class	Subclass	Translation	Yes	No	
Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)										
Examiner /Alexander Eisen/					Date Considered 05/30/2006					
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